The Pros and Cons of Requiring SCRATCH in the Applied Linguistics Classroom: Student and Student-teachers' Reactions and Recommendations, Instructor's Observations for EISTA 2017

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ABSTRACT

For six Fall semesters (2010-2014, 2016), undergraduate and graduate students and student-teachers taking Applied Linguistics (LN400, LN500) at the University of Guam were required to design, present at a regional conference, and submit a final project using SCRATCH, a free, downloadable children's programming software from MIT. Their projects had to reflect second / foreign language learning and teaching theories, as well as their own personal fields of specialization and interests, from teaching language and literature, to other content areas like pragmatics, rhetoric/composition, and sociolinguistics. At the end of the semester, every student had to submit a CD / thumb drive and paper discussing their personal experiences in attempting to link theories of learning and teaching to designing actual lessons with SCRATCH. They were told that their projects had to reflect their imaginative creativity, multi-cultural and ethnic sensitivity, familiarity with second language learning theories, and teaching ability. This presentation will continue to discuss the value of SCRATCH in the applied linguistics classroom by summarizing six semesters' worth of students' comments about the rewards and frustrations with the program, and the instructor's observations and assessment of students' projects.

Keywords: applied linguistics, technology, language teaching, communicative competence in L2

1. INTRODUCTION

The impetus for this six-semester project was an August 2010 conference on Constructionism sponsored by the American University in Paris. One of the paper presentations showed an interchange between two grade school students using SCRATCH-activated animated stick figures. Since one of the topics covered in the Applied Linguistics class at the University of Guam is the use of technology in the language classroom, I thought that this could be a good way to show university students one of the new ways very young learners were using a basic programming application, as well as introduce them to an innovative tool for designing lessons using a free downloadable program that will help them learn some rudiments of programming as well. The success of the original one-semester project turned into six.

Seymour Papert's Constructionism claims that students learn by using any and all tools available, e.g., manipulatives, blocks, sculptures, technology-related tools, etc., that help and cause them to continuously learn by forming and revising theories in the effort to make sense of the world around them. Constructionism is relevant to foreign language acquisition because a learning a second or third language involves and necessitates tools that help build a whole new set of linguistic and sociocultural rules or "theories" – i.e., new ways of speaking, understanding, and behaving using the same universal features of language, in order to attain communicative competence. It was Papert who showed the role of technology in building blocks of knowledge in the 1980s, by introducing his engaging LOGO-with-turtle program for children that adults enjoyed as well.

Applied Linguistics

Applied Linguistics at the University of Guam is a one-semester undergraduate / graduate course that English as a Second Language (ESL/EFL), B.A. in English-linguistics track, and English for Education students, must take. It is an elective course for English-literature track students, Micronesian Studies majors, and other majors and minors from the School of Education and the College of Liberal Arts and Social Sciences. Although the LN400/500 course surveys the main subfields of Applied Linguistics, the first half of the semester covers second/foreign language acquisition theories, e.g., Cross-linguistic Influence or CLI (Kellerman 1995, Odlin 2003) –the weak version that remains from the controversial Contrastive Analysis Hypothesis (Lado 1957); Krashen's (1981, 1982, 1983, 1985, 1997) theory with its bundle of five hypotheses – Monitor, Acquisition vs. Learning, Affective Filter, Input i+1, and Natural Order Hypotheses; Cognitive Theory and Approaches (McLaughlin 1987, Scovel 1999, R. Ellis 1997; q.v., Mitchell, Myles, Marsden 2015); Social Constructivist Theories (Long 1996, 2003); Inter/Intralanguage Fossilization Theories (Selinker & Lamendella 1979, Long 2003); Linguistics/Universal Theory (Chomskyan) and Functional Approaches (q.v., Mitchell, Myles, Marsden 2015). The second half of the semester is spent covering some subfields of Applied Linguistics, e.g., (applied) linguistics, poetics, and literature in stylistics, formalism, and deconstruction; language planning, language in education planning, and Computer-Assisted Language Learning (CALL). Students were expected to link and apply any one or any combination of these theories and subfields to their SCRATCH projects.

Three previous papers (Quan 2013, 2014, 2016) proposed a model of the relationship between L2Acquisition theories and communicative classroom methods in the applied linguistics class projects based on Hymes' (1974) notion of "communicative competence". Below is the proposed model that attempts to capture these. This model illustrates the relationships and interplay between L2Acquisition theories, classroom methods, as well as Lesson Plans and Tools, where SCRATCH fits.

COMMUNICATIVE COMPETENCE IN A FOREIGN/SECOND LANGUAGE CLASS

Fun, Engaging, Practical Activities & Pertinent Assessment

L2ACQUISITION THEORIES ← →	**COMMUNICATIVE CLASSROOM METHODS ← →**	**LESSON PLANS & TOOLS**
Included:	TASK and CONTENT-BASED	**(exploring SCRATCH)**
Learner /learning characteristics	Linguistics: Phonology, Morphology, Syntax, Semantics	Teachers using & evaluating
Psycho-social factors	Content area learning/teaching: language, literature, soc.studies…	the effectiveness of available
Socio-cultural factors	Culture, social learning/teaching	programs & tools
Linguistic universals	Teaching philosophies behind Methods	Text/workbooks, technology,
	4 skills: Speaking, Listening, Reading, Writing	manipulatives, visuals
Assessment Options	Goals/Objectives	Actual Assessment Choices

2. COMMUNICATIVE COMPETENCE & SCRATCH

H.D. Brown (2007) enumerated some characteristics of an ideal communicative language teaching classroom (cf. Hymes 1972 on communicative competence). They include the need for the following: A) cultural, social, as well as linguistic competence since learners must also conform to the social and cultural norms of the speech community where grammatical errors are more forgivable than social ones. For example, a priest, pastor, or rabbi cussing in church or synagogue will entail serious consequences; the same person committing a subject/verb agreement error will not; B) authenticity and functionality in lesson design because a speaker should sound natural and what he is taught must have practical uses; C) the necessity in the early stages, of sometimes sacrificing grammatical accuracy for fluency, or "getting the point across" for successful communication. A speaker who consults a dictionary for every word he wants to communicate can be more distracting than the grammatical errors of the message, except perhaps in writing since oral communication is more forgiving than the written word. Even so, a two-sentence paragraph essay assignment painstakingly written may not necessarily be preferable to one with three paragraphs engagingly written, albeit dotted with errors in mechanics; D) the need to develop students' ability to actually be able to function in real-life situations, in the target language setting, beyond the classroom. One traditional, perhaps extreme trial by fire assessment activity was developed by Dartmouth College's John Rassias in the 1970s, which left the learner in the middle of nowhere in the target language (monolingual) speech community with little or no money. The learner had to find and his way to a particular destination with no choice but to negotiate his way using the target language. This underscores the importance of students actually living in a place where the Target Language is the ordinary/default mode of everyday communication. This also implies the importance of students understanding, producing, and writing in different speech and rhetorical styles as the goal of the language learning classroom. To Brown's list I added three more characteristics of an ideal L2 communicative classroom (q.v., Quan 2016): E) the need for positive rapport between students and between students and the teacher in the language classroom, to facilitate language learning/acquisition. A positive environment contributes to positive attitudes, openness, lack of fear in making mistakes, the formation of new friendships and possibility of collaboration in the language classroom; F) the goal of decreasing the role and power of the teacher from sole informant, to guide, to minor guide, to an ideal absentee observer, in order to prepare students for the target language real-life environment; and, G) the acceptability of using the native language(s) to teach/learn the target language, at least in the early stages, to relieve tension and fear, and facilitate acquisition.

SCRATCH is a relatively simple computer language that was originally designed to teach children the basics of programming /coding using a simple, creative, fun, logical, drag-and-drop system. But the program can be used by adults as well, to design simple-to-complex graphics, animation, interactive games. It is a promising tool for educators without programming backgrounds since the simplicity of the program will enable them to learn the rudiments of Scratch on their own, and use it as a teaching and or assessment tool. This free and downloadable program consists of a sprite and other characters, as well as a list of commands that can be used in any project. All commands are listed along the side of the program in the form of puzzle or lego-like pieces that can be added to the script. Developed by MIT Media Lab's Lifelong Kindergarten Group led by Papert's student Mitchel Resnick, with support from organizations and businesses like the National Science Foundation, Microsoft, Google, and Intel, SCRATCH was designed to stimulate and encourage children, older students, and adults to think critically, logically, and creatively, and work collaboratively. Children growing up will then already be eased into the rudiments of programming/coding, and be familiar and comfortable with its workings without consciously realizing it. But based on six semesters' worth of SCRATCH projects' results in the applied linguistics class, most adults 18 and older will most likely struggle more to learn the program. Posted tutorials from SCRATCH and YouTube are invaluable to those wishing to learn using the program. Fall 2010, 2011, and 2012 applied linguistics students used SCRATCH Version 1.4; Fall 2013, 2014, and 2016 students used the newer version, SCRATCH 2.0. A new SCRATCH Version 3.0 is scheduled to be released in 2017. It is hoped that the newest version will take care of the "bugs" that bugged and frustrated students.

SCRATCH in Applied Linguistics

The first year of the SCRATCH 1.4 project in the Applied Linguistics classroom was exploratory and collaborative, with each group of 3 or 4 students submitting one project. In the second through the sixth Fall semesters, every student was required to program his or her own project, although students were encouraged to work in groups to help each other out, or for "knowers" to help others. In the second year, a student from the previous year was invited to speak to the class, give advice, and answer questions about the program. This knower-helping-novices approach apparently helped students a lot. From Fall

2013, students used the newest version of Scratch (2.0) to plan, prepare and submit their individual projects. As part of the class requirement, students had to present their SCRATCH projects at the University of Guam's Annual Regional Language Arts Conference, to encourage them to do their best work in front of an audience composed of educators, administrators, and other students from Guam, Micronesia, and Asia.

In the course of six semesters, criteria for evaluating students' projects have been developed (Quan 2013, 2014, 2016). They involve examining how the individual projects tie in with the theories of foreign language acquisition and communicative learning methods, or with other content areas for non-education majors.

At the end of the semester, students had to submit CD or thumb drive copies of their projects. Additionally, just as the teacher assessed students' individual projects, students were, in turn, asked to submit narrative summaries to evaluate / assess their learning experience with the SCRATCH program and its possible usefulness/value in the (foreign) language class and other content areas, as well as their recommendations for other SCRATCH users. Education majors had to submit a lesson plan integrating their SCRATCH project into the learning objectives for their students. The most important question they were asked to address was, as present or future teachers, would they use SCRATCH in their classrooms? The majority of them replied in the affirmative.

3. STUDENTS' AND STUDENT-TEACHERS' EVALUATIONS OF SCRATCH

Below are three tables summarizing the University of Guam's Applied Linguistics students' evaluations of SCRATCH 1.4 from 2010-2012; SCRATCH 2.0 from Fall 2013-2014; and in Fall 2016.

TABLE 1
2010-2012
Applied Linguistics Students' Evaluation of SCRATCH 1.4

Positive Comments (2010-2012)

Overall assessment

1. Fun!
2. A great learning experience
3. No limit as to what it can do

Comments about the Program

4. A creative alternative to PowerPoint, lectures, chalkboards, with the teacher talking all the time!

Learning Benefits for Students/Learners

5. A useful tool for ESL/EFL students as well as native speakers of English
6. Middle and High School students can use SCRATCH to do presentations, have fun, create games themselves

Advantages for (Student) Teachers

7. A useful tool for educators who want a different teaching method in the classroom
8. Teachers placed on the cutting edge of technology
9. Allows teachers to be very creative

Negative Comments (2010-2012)

Overall Assessment

1. Very time consuming!
2. What if classrooms don't have computers?
3. What if students don't have computers at home?

Technical Comments about the program

4. Not easy to use and learn in the beginning
5. Hard to coordinate sounds, movements
6. Takes a few days to learn and feel comfortable with the program
7. YouTube videos and tutorials were too basic

Teaching/Teacher Struggles

8. Takes a lot of time and patience teachers may not have
9. Commands are hard to learn; challenging for teachers who are not programming-savvy!

TABLE 2
2013-2014
Applied Linguistics Students' Evaluation of SCRATCH 2.0

Positive Comments (2013-2014)

Overall Assessment

1. Fun! Interactive!
2. An inspiring tool that promotes learning!
3. A good tool for incorporating technology into the classroom
4. Enables kids and adults to learn programming
5. A useful bridge to other programming languages
6. A bonding experience with other SCRATCH users
7. A new teaching style for teachers, a new learning style for students.

Technical Comments about the Program

8. Ease of recording audio material
9. Users can integrate any outside photo/drawing into the program
10. Program can give immediate virtual feedback

Learner/learning Benefits

11. Availability of tutorials, as well as a sprite library for resources
12. SCRATCH 2.0 has tutorials for every one of its 10 steps posted on website
13. Availability of sample programs from the website and YouTube to help w/ programming & ideas
14. Problems, questions, and difficulties not addressed by Scratch website are Google-able

Advantages for Teachers

15. A versatile tool for teaching anything, not just ESL/foreign languages
16. A useful program for teaching students and teachers of all ages
17. An innovative way to teach digital literacy

Negative Comments (2013-2014)

Overall assessment

1. Very time-consuming; very tedious
2. Not everyone is interesting in programming
3. Program's tutorial voice sounded bored and boring
4. Takes a few hours to a few days to learn and feel comfortable with the program

Technical Comments

5. Must coordinate sounds, movements, bubbles/conversations to minimize overlaps/interference
6. Even minor editing means watching the entire presentation from the beginning, for timing & aesthetics
7. Hard to coordinate sprites, backgrounds, functions, sounds
8. Program lacks a conventional playback method; "snapping" feature was annoying
9. Problems with the Costumes tabs; enlarges the character; must restart program to fix them – a waste of time!
10. Speech bubbles of characters can cover other characters in the program.
11. A minor change in the program entails playing the entire program to coordinate timing
12. As scripts expand, program becomes slower to navigate; must be broken into sets

Teaching/Teacher Struggles

13. Program is time-consuming for teachers with deadlines
14. Confusing and intimidating in the beginning, esp. for teachers starting from scratch

TABLE 3
Fall 2016
Applied Linguistics Students' Evaluation of SCRATCH 2.0

Positive Comments (Fall 2016)

Overall Assessment

1. Fun – enjoyable & versatile
2. Amazing program with limitless interactive possibilities
3. Stepping stone to more established programming
4. Results are attention catching, engaging, and innovative
5. User friendly and with enough time, one can create great projects.
6. Exhausting but rewarding!
7. An attention grabber
8. No need to purchase Powerpoint – it's free!

Technical Comments about Scratch

9. Ease of use
10. Easy format
11. Instant feedback from student performance possible
12. Off-line version is practical for islands like Guam where power and WiFi can be erratic
13. Great for tech savvies, with lots of online tools

Learner/Learning Benefits

14. Can localize teaching to local students and locale's flora and fauna
15. Can be an in-class or solitary activity outside class
16. Provides an understanding of coding rudiments

Advantages for Teachers

17. Useful tool to use and share with other teachers
A breath of fresh air – new ways to teach old, same old same old subjects
18. Can localize teaching to local students and locale's flora and fauna
19. Can easily be incorporated into a lesson plan
20. Not a cookie cutter program! Lessons can be original

Negative Comments (Fall 2016)

Overall Assessment

1. Too time-consuming
2. Other easier-to-use programs are available online
3. Difficult to learn
4. Lots of time and patience needed
5. Harder than it looks. Deceptively easy to learn.

Technical Comments

6. Easier to use set templates for teaching tools rather than going through coding rudiments
7. Not easy for those not tech-savvy
8. Too many commands and characters
9. SCRATCH sounds and backgrounds eventually sound and look "generic". Better to use your own.
10. Glitches are irritating
11. For newbies, more tutorials are needed
12. Frustrating in the beginning when sprites won't behave like they should. One little mistake results in going back to the beginning and going through the scripts again and again.
13. Available scripts are limited; can be frustrating more more tech savvy teachers who wish to write more complex lessons
14. The same program that worked at home had glitches when presented in class and in the conference

Teaching/Teacher Struggles

15. Not all teachers are interested in coding
16. Teachers don't have enough time and don't get paid enough to take the time to learn and prepare lessons using this program.
17. Not all students have access to computers nor WiFi's

4. SUGGESTIONS FROM STUDENTS: 2010-2014, FALL, 2016

In the course of 6 Fall semesters, six suggestions from students stand out. First, several students suggested using SCRATCH to teach SCRATCH for hands-on experience with the program. Secondly, older learners suggested (re)designing the program to reach older learners not previously exposed to technology, if the program were to attract older learners who may not be as tech-savvy as the children the program was designed to teach. A third suggestion was addressed to students who were advised to have pre planned and prepared scripts, dialogues, audio files, video files, sprites, and backgrounds written down before starting the programming, in order to coordinate the "fun" of learning programming, the teaching methodology of the lesson, the theories of Second Language Acquisition that apply, and the focus/content of the project. Other students claimed that it was not enough to consult just the SCRATCH website. YouTube tutorials were also indispensable to learning the program step by step. A few observed that glitches seem to occur with Scratch 2.0 that need to be addressed. Finally, all students insisted that most, if not all, Scratch and YouTube tutorials must be watched and studied before starting the project.

5. INSTRUCTOR OBSERVATIONS OF STUDENT PERFORMANCE

Six semesters of requiring SCRATCH in the Applied Linguistics class have resulted in the following interesting observations:

1. For students, the process of designing the SCRATCH project is not linear. Based on 6 semesters' observations, the steps for many student teachers appear to be: a) Downloading Scratch – often the offline version; b) Tinkering with the program itself; c) Looking at tutorials that come with the program for familiarization and YouTube-posted how-to's; d) Playing with, manipulating very simple programs; e) Planning, designing their personal project: audience, purpose, method, content, characters, layout, backgrounds: sounds, colors, plot (if applicable); f) Looking for more possible tutorials and other sample programs from the Scratch website, YouTube, or Google that loosely match what students aim to do; g) Writing the program; h) Looking for sample programs again to see how their program matches the sample programs and to figure out how to make necessary modifications and corrections; i) editing, correcting, modifying, simplifying, adding on; going back to the beginning to fix glitches; j) going back and forth between all steps as many times as possible; k) changing or scrapping the planned program if necessary and starting over again; l) running the program as many times as possible to test how well it runs; m). running the program in class; n) presenting the project at the University of Guam's Annual Regional Language Arts Conference; o) making necessary changes based on teacher and classmate feedback before turning in the project and its write-up; p) fitting the project into an actual lesson plan. In Fall 2016, students presented and ran their projects in class the week before rather than after the conference; help and advice were offered to those who needed them. Some students, upon seeing the quality of others' work, modified their own for the conference.

2. SCRATCH project comprises 30-40% of the final grade in LN400/500. What should the role be of students' previous (programming) backgrounds in assessing the final project? – expect more from more experienced students; less so for those with minimal or no backgrounds? Should assessment be based solely on the finished product regardless of student's previous programming background experience or lack thereof? It's not difficult to differentiate last-minute hurried slapdash work, from painstaking ones of inexperienced students.

3. Collaborative work works! It helped to have a "knower" from a previous semester answer students' questions about their own personal project. As a 2016 student commented, it was fun getting together for late-night SCRATCH meetings at the Guam Hilton's Coffee Bar to offer or seek help and exchange information.

4. Extra pressure made for better work: the University of Guam Language Arts Conference presentations prodded students to work faster, and better, even though it was somewhat stressful for those who had never presented at a conference before!

5.In the 6 semesters that SCRATCH was required, students' projects were determined by their fields of specialization or interest. Education majors had no choice but do a SCRATCH project with a lesson plan; literature, linguistics, anthropology and other majors designed projects related to their fields. Many students focused on teaching foreign languages other than English spoken or taught on Guam: Japanese, Korean, Tagalog/Pilipino, Spanish, Chamorro.

6.Several of my adult students claimed that when stuck, their high school-age children helped them with their projects! Is it easier for kids to learn SCRATCH than adults?

7.Among issues to be addressed are copyrighted materials. If teachers use Disney or Star Wars characters in their projects, for example, what do copyright laws require? What are the possible negative consequences if they were to post these projects online, for example? Do they have to invent their own characters instead of borrowing characters the audience is already familiar with, like Princess Leah, Mater, Dory, R2D2, Hello Kitty, Super Mario, Moana, or Dora the Explorer?

8.The most promising value of SCRATCH lies in its versatility. It allows teachers to LOCALIZE and personalize the teaching material. Instead of "imported" predesigned cookie cutter non-local based exercises and activities, teachers can tailor lessons to fit the students' learning styles and cultural backgrounds/settings. This just may lead to more effective learning.

6. CONCLUSION

Applied Linguistics students at the University of Guam will continue using SCRATCH in their projects that will be presented at the university's Annual Regional Language Arts Conference. The versatility and the timely upgrading of the program to make it more user-friendly for children and adults place it in the cutting edge of basic programming and teaching. By Fall 2017 semester, students should be using the new SCRATCH 3.0, if released this year. SCRATCH is one of the tools that teachers can use to feel comfortable with the rudiments of programming, enhance and reinforce language learning as well as learning in the other content areas. A handful of students already familiar with some programming see its limitations. But for the majority of adult learners in the class, its simplicity is its strength because its user-friendliness makes it accessible to anyone without any previous background in coding/programming. Its "cartoon" characters make it (and therefore also the process of programming) less intimidating to children and adults alike. Of course, some students will enjoy the program; others will struggle. For applied linguistics students, the SCRATCH project hones their critical thinking skills; introduces teachers-to-be to the rudiments of novice-level programming; encourages group/ collaborative work, and develops and stimulating future teachers' imaginative and creative abilities in teaching and learning.

Future studies using SCRATCH could include quantifying students' responses; including the rubrics for assessing students' projects; students assessing the quality of each other's work; and suggesting or allowing another SCRATCH-comparable program in students' projects for comparison purposes, e.g., Snap, or Kodu.

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